

Claims

What is claimed is:

- [c1] A glass composition comprising 59-66 mol % SiO_2 , 14.5-18.0 mol % Al_2O_3 , 8.5-12.0 mol % Na_2O , 2.5-6.5 mol % K_2O , 2.5-9.0 mol % CaO , 0.0-3.0 mol % MgO , 0.0-3.0 mol % SrO , 0.0-3.0 mol % BaO , and 0.0-5.0 mol % $\text{MgO}+\text{SrO}+\text{BaO}$.
- [c2] The glass composition of claim 1 having a liquidus temperature of 1100°C or less.
- [c3] The glass composition of claim 1 having a viscosity at a liquidus temperature of at least 10^5 poise.
- [c4] The glass composition of claim 1 having a viscosity at a liquidus temperature in excess of 4×10^5 poise.
- [c5] The glass composition of claim 1 having a linear coefficient of thermal expansion of 80 to $95 \times 10^{-7}/^\circ\text{C}$ over a temperature range of 25 to 300°C.
- [c6] The glass composition of claim 5 having a linear coefficient of thermal expansion of 87 to $92 \times 10^{-7}/^\circ\text{C}$ over a temperature range of 25 to 300°C.
- [c7] The glass composition of claim 1 having a strain point greater than 580°C.
- [c8] The glass composition of claim 7 having a strain point of at least 640°C.
- [c9] The glass composition of claim 1 further comprising at least one oxide selected from the group consisting of B_2O_3 , P_2O_5 , Li_2O , Y_2O_3 , La_2O_3 , and ZnO in a total amount not exceeding 5 mol %.
- [c10] The glass composition of claim 1 wherein a molar ratio of Na_2O to K_2O is approximately 1.0.
- [c11] The glass composition of claim 1 wherein a molar ratio of Na_2O to K_2O is in a range from 1.2 to 3.0.

- [c12] The glass composition of claim 1 comprising 60-65 mol % SiO₂, 15.5-17.0 mol % Al₂O₃, 9.5-11.0 mol % Na₂O, 3.5-5.5 mol % K₂O, 3.5-8.0 mol % CaO, 0.0-2.0 mol % MgO, 0.0-2.0 mol % SrO, 0.0-2.0 mol % BaO, and 0.0-3.0 mol % MgO+SrO+BaO.
- [c13] The glass composition of claim 1 further comprising at least one oxide selected from the group consisting of B₂O₃, P₂O₅, Li₂O, Y₂O₃, La₂O₃, and ZnO in a total amount not exceeding 3 mol %.
- [c14] A glass composition comprising 59-66 mol % SiO₂, 14.5-18.0 mol % Al₂O₃, 8.5-12.0 mol % Na₂O, 2.5-6.5 mol % K₂O, 2.5-9.0 mol % CaO, 0.0-3.0 mol % MgO, 0.0-3.0 mol % SrO, and 0.0-3.0 mol % BaO.
- [c15] The glass composition of claim 14, wherein MgO+SrO+BaO are present in a total amount of 0-5 mol %.
- [c16] The glass composition of claim 14, comprising 60-65 mol % SiO₂, 15.5-17.0 mol % Al₂O₃, 9.5-11.0 mol % Na₂O, 3.5-5.5 mol % K₂O, 3.5-8.0 mol % CaO, 0.0-2.0 mol % MgO, 0.0-2.0 mol % SrO, and 0.0-2.0 mol % BaO.
- [c17] The glass composition of claim 16, wherein MgO+SrO+BaO are present in a total amount of 0-3 mol %.
- [c18] A glass composition comprising 59-66 mol % SiO₂, 14.5-18.0 mol % Al₂O₃, 8.5-12.0 mol % Na₂O, 2.5-6.5 mol % K₂O, 2.5-9.0 mol % CaO, 0.0-3.0 mol % MgO, 0.0-3.0 mol % SrO, 0.0-3.0 mol % BaO, and 0-5 mol % MgO+SrO+BaO, the glass composition exhibiting a strain point of at least 640°C and a linear coefficient of thermal expansion of 80 to 95 x 10⁻⁷/°C over a temperature range of 25 to 300°C.
- [c19] The glass composition of claim 18 having a liquidus temperature of 1100°C or less.
- [c20] The glass composition of claim 18 having a viscosity at a liquidus temperature of at least 10⁵ poise.
- [c21] The glass composition of claim 18 having a viscosity at a liquidus temperature in excess of 4 x 10⁵ poise.

[c22] The glass composition of claim 18 comprising 60-65 mol % SiO₂, 15.5-17.0 mol % Al₂O₃, 9.5-11.0 mol % Na₂O, 3.5-5.5 mol % K₂O, 3.5-8.0 mol % CaO, 0.0-2.0 mol % MgO, 0.0-2.0 mol % SrO, 0.0-2.0 mol % BaO, and 0.0-3.0 mol % MgO+SrO+BaO.

[c23] A glass substrate for an electronic display device, comprising 59-66 mol % SiO₂, 14.5-18.0 mol % Al₂O₃, 8.5-12.0 mol % Na₂O, 2.5-6.5 mol % K₂O, 2.5-9.0 mol % CaO, 0.0-3.0 mol % MgO, 0.0-3.0 mol % SrO, 0.0-3.0 mol % BaO, and 0.0-5.0 mol % MgO+SrO+BaO.

[c24] A glass substrate for an electronic display device, comprising:

a flat, transparent glass exhibiting a strain point of at least 640°C and a linear coefficient of thermal expansion of $80 \text{ to } 95 \times 10^{-7}/^{\circ}\text{C}$ over a temperature range of 25 to 300°C, the glass comprising 59-66 mol % SiO₂, 14.5-18.0 mol % Al₂O₃, 8.5-12.0 mol % Na₂O, 2.5-6.5 mol % K₂O, 2.5-9.0 mol % CaO, 0.0-3.0 mol % MgO, 0.0-0.3 mol % SrO, 0.0-3.0 mol % BaO, and 0.0-5.0 mol % MgO+SrO+BaO.

[c25] A method of producing a glass panel for an electronic device, comprising:

melting a glass batch comprising 59-66 mol % SiO₂, 14.5-18.0 mol % Al₂O₃, 8.5-12.0 mol % Na₂O, 2.5-6.5 mol % K₂O, 2.5-9.0 mol % CaO, 0.0-3.0 mol % MgO, 0.0-3.0 mol % SrO, 0.0-3.0 mol % BaO, and 0.0-5.0 mol % MgO+SrO+BaO;
and

drawing a thin sheet of molten glass from the melt.

[c26] The method of claim 25, wherein the glass sheet is drawn by the fusion draw process.